

How to setup & run a MIIC OPeNDAP Server

The following instructions show how to install a Hyrax 1.13 OPeNDAP server and MIIC plugin on a Centos server using prebuilt rpms.

If you already have the Hyrax 1.13 server installed and configured and you wish to install the MIIC Plugin please skip ahead to this section:

- [Install MIIC plugin for Hyrax 1.13](#)

Install Hyrax 1.13.2

Install Operating System (Centos 6 & Centos 7 are currently supported)

- Follow the instructions for setup of Operating System from www.centos.org

Obtain the latest Hyrax release from the OPeNDAP website: <http://opendap.org>

- Hyrax 1.13.2 is currently required. Other versions may also work provided the MIIC plugin is built from source.
- Download and install required libraries: libdap, bes
- OLFS is also required: i.e. "opendap.war"
 - We recommend using a Java 8 JDK/JRE (not Java 7).
 - We also recommend using the latest version 7 Tomcat which will include Java 8 support: <https://tomcat.apache.org/download-70.cgi>

Update Operating System

Update the operating system... usually a good idea.

```
yum update
```

Install BES server

Install the BES server rpms

```
sudo yum install libdap-3.18*.rpm bes-3.17.3*.rpm
```

Install OLFS web app

Install latest tomcat 7 server (7.063 or newer <https://tomcat.apache.org/download-70.cgi> – not yet available in the yum repository)

Create folder for OLFS owned by tomcat user to unpack its config files

```
mkdir /etc/olfs
chown -R tomcat /etc/olfs
chgrp -R tomcat /etc/olfs
chmod 775 /etc/olfs
```

Deploy the OLFS web app

```
tar -zxvf olfs*webapp.tgz  
cd olfs*webapp  
cp opendap.war [your tomcat home]/webapps
```

Start and then stop tomcat. This will unpack the default configs to /etc/olfs

```
/etc/init.d/tomcat start  
/etc/init.d/tomcat stop
```

Important: Set the number of concurrent requests that can be handled by the BES, if desired. Normally, you would set this to the number of cores on the machine.

```
vi /etc/olfs/olfs.xml  
  
<ClientPool maximum="32" maxCmds="2000" />
```

Set the timeout of server requests to match the value expected by MIIC (1000 seconds by default)

```
vi /var/lib/tomcat/content/opendap/olfs.xml  
  
<!-- Timeout (in seconds) for this BES, defaults to 300 seconds-->  
<timeOut>1000</timeOut>
```

These instructions assume the OPeNDAP front-end (OLFS) will be installed on the same server as the OPeNDAP back-end (BES). If you wish to use a different configuration you will need to edit the OLFS configuration file on your OLFS server to make it point to your BES server(s).

For example, this OLFS configuration points to two separate BES servers. The prefix "/" indicates that the entire archive is served by both servers round-robin.

```
<BESManager>  
  
<BES>  
  
  <prefix>/</prefix>  
  <host>192.168.17.42</host>  
  <port>10022</port>  
  <maxResponseSize>0</maxResponseSize>  
  <ClientPool maximum="32" maxCmds="2000" />  
  
</BES>  
  
<BES>  
  
  <prefix>/</prefix>  
  <host>192.168.17.43</host>
```

```
<port>10022</port>
<maxResponseSize>0</maxResponseSize>
<ClientPool maximum="32" maxCmds="2000" />
</BES>
</BESManager>
```

Configure BES modules

Configure FreeForm handler to load files ending in ".bin" (largely for historical McIDAS file support)

```
vi /etc/bes/modules/ff.conf

Add the following to the end of the file:

BES.Catalog.catalog.TypeMatch+=ff:.*\.bin(\.bz2|\.\gz|\.\Z)?$;
```

Configure HDF4 handler to load files ending in numbers (as in CERES SSF files)

```
vi /etc/bes/modules/h4.conf

Add the following type match:

BES.Catalog.catalog.TypeMatch+=h4:^.*_[0-9]{6}\.[0-9]{10}\$;
```

Configure BES module to point to the data you will serve

```
vi /etc/bes/bes.conf

Change the line to point to your data. In this example, all data is located
at /ASDC_Archive.

BES.Catalog.catalog.RootDirectory=/ASDC_Archive
```

Configure BES module if you want to use symbolic links in your archive

```
vi /etc/bes/bes.conf

Change the line to allow symlinks:

BES.Catalog.catalog.FollowSymLinks=Yes
```

Install MIIC plugin for Hyrax 1.13

The latest Hyrax 1.13 MIIC plugin is available as an RPM for Centos 6 and 7 here: [MIIC OPeNDAP Plugin](#)

Install MIIC plugin for BES

Install MIIC plugin rpm. At the moment, we use the "-force" option when the plugin is already installed.

```
rpm -Uvh --force miic_module-[VERSION].el[6|7].x86_64.rpm
rpm -Uvh --force miic_module-debuginfo-[VERSION].el[6|7]-x86_64.rpm
```

HTTP POST access is required by MIIC Plugin clients, since the URLs can become extremely long.

```
vi /etc/olfs/olfs.xml

Uncomment <HttpPostHandlers> element
Add the following inside the <HttpPostHandlers> tag:

<Handler className="opendap.bes.BesDapDispatcher">
  <UseDAP2ResourceUrlResponse />
  <PostBodyMaxLength>5242880</PostBodyMaxLength>
</Handler>
```

Configure the MIIC module so it is loaded by the OPeNDAP BES.

```
vi /etc/bes/modules/miic.conf

Add the following lines:

BES.Include=functions.conf
BES.modules+=miic
BES.module.miic=/usr/lib64/bes/libmiic_module.so
```

Start & Verify OPeNDAP Server

Starting / Stopping BES Server

To start the BES Server

```
/usr/bin/besctl start
```

To start the BES Server with MIIC Plugin debug output

```
/usr/bin/besctl start -d"cerr,miic"
```

To stop the BES Server

```
/usr/bin/besctl stop
```

Starting / Stopping OLFS Tomcat Server

To start the Tomcat Server

```
/etc/init.d/tomcat start
```

To stop the Tomcat Server

```
/etc/init.d/tomcat stop
```

Verify OPeNDAP Server

Level 1: Server is running

- Start the BES and OLFS/Tomcat servers.
- Open a web browser to your OPeNDAP server, e.g. "localhost:8080/opendap"

Level 2: Files are available

- Browse the folders and verify that the files you want to serve via OPeNDAP are there.
- If you can't find files or folders, revisit your /etc/bes/bes.conf and /etc/bes/modules/dap.conf settings for RootDirectory and FollowSymLinks.

Level 3: Files have links

- Verify the files you want to serve have "DAP Response Links". If the file appears without links that usually means:
 - The BES file handler is not installed. Revisit the RPM installation instructions above.
 - The BES file handler is not configured properly. Revisit the handler conf file in /etc/bes/modules.

Level 4: MIIC plugin

- Verify the miic plugin is loaded. In a web browser, enter a url to any data file on your server, followed by "?miic_version()"

- For example: [http://id33gp.cluster.net:8080/opendap/hyrax/CERES/SSF/Terra-FM1-MODIS_Edition3A/2013/01/CER_SSF_Terra-FM1-MODIS_Edition3A_303305.2013010110?miic_version\(\)](http://id33gp.cluster.net:8080/opendap/hyrax/CERES/SSF/Terra-FM1-MODIS_Edition3A/2013/01/CER_SSF_Terra-FM1-MODIS_Edition3A_303305.2013010110?miic_version())
- The response should include the plugin version. For example, the version returned below is 1.5.1:

```
Dataset:  
function_result_CER_SSF_Terra-FM1-MODIS_Edition3A_303305.2013010110  
1.5.1, ""
```

- How to setup & run a MIIC OPeNDAP Server
- How to deploy MIIC web archive
- How to build the MIIC OPeNDAP plugin
- How to debug OPeNDAP SSFs
- How to Profile OPeNDAP Server